38/3,K/11 (Item 11 from file: 350) **Links**
Derwent WPIX


010135468 **Image available**
WPI Acc No: 1995-036719/199505
XRPX Acc No: N95-028884

**Method for allocating files in file system using disk arrays for storage - has mode selected with dirty block from list with write allocation of tree or buffers for reference for storage in raid array with determination of completion**

Patent Assignee: NETWORK APPLIANCE INC (NETW-N); HITZ D (HITZ-I); LAU J (LAUJ-I); MALCOLM M (MALC-I); RAKITZIS B (RAKI-I); NETWORK APPLIANCE CORP (NETW-N)
Inventor: HITZ D; LAU J; MALCOLM M; RAKITZIS B
Number of Countries: 020 Number of Patents: 012
Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week | |
|---|---|---|---|---|---|---|---|
| WO 9429796 | A1 | 19941222 | WO 94US6322 | A | 19940602 | 199505 | B |
| EP 701716 | A1 | 19960320 | EP 94919368 | A | 19940602 | 199616 | |
| | | | WO 94US6322 | A | 19940602 | | |
| JP 8511369 | W | 19961126 | WO 94US6322 | A | 19940602 | 199708 | |
| | | | JP 95502001 | A | 19940602 | | |
| CA 2165911 | A | 19970622 | CA 2165911 | A | 19951221 | 199743 | N |
| US 6038570 | A | 20000314 | US 9371640 | A | 19930603 | 200020 | |
| | | | US 95464591 | A | 19950531 | | |
| US 6138126 | A | 20001024 | US 95464591 | A | 19950531 | 200055 | N |
| | | | US 99359168 | A | 19990721 | | |
| EP 1197836 | A2 | 20020417 | EP 94919368 | A | 19940602 | 200233 | |
| | | | EP 2002858 | A | 19940602 | | |
| EP 701716 | B1 | 20020814 | EP 94919368 | A | 19940602 | 200255 | |
| | | | WO 94US6322 | A | 19940602 | | |
| | | | EP 2002858 | A | 19940602 | | |
| DE 69431186 | E | 20020919 | DE 94631186 | A | 19940602 | 200269 | |
| | | | EP 94919368 | A | 19940602 | | |
| | | | WO 94US6322 | A | 19940602 | | |
| US 20040064474 | A1 | 20040401 | US 9371640 | A | 19930603 | 200425 | |
| | | | US 95464591 | A | 19950531 | | |
| | | | US 99359168 | A | 19990721 | | |
| | | | US 2000624753 | A | 20000724 | | |
| | | | US 2003637803 | A | 20030808 | | |
| US 6751637 | B1 | 20040615 | US 95464591 | A | 19950531 | 200439 | N |
| | | | US 99359168 | A | 19990721 | | |
| | | | US 2000624753 | A | 20000724 | | |
| CA 2165911 | C | 20050726 | CA 2165911 | A | 19951221 | 200551 | N |

Priority Applications (No Type Date): US 9371640 A 19930603; CA 2165911 A 19951221; US 95464591 A 19950531; US 99359168 A 19990721; US 2000624753 A 20000724; US 2003637803 A 20030808
Patent Details:

| Patent No | Kind | Lan | Pg | Main IPC | Filing Notes |
|---|---|---|---|---|---|

WO 9429796 A1 E 66 G06F-012/02
Designated States (National): JP
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
EP 701716 A1 E 66 Based on patent WO 9429796
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
JP 8511369 W 68 G06F-012/00 Based on patent WO 9429796
CA 2165911 A G06F-017/30
US 6038570 A G06F-017/30 Cont of application US 9371640
US 6138126 A G06F-017/30 Cont of application US 95464591
EP 1197836 A2 E G06F-003/06 Div ex application EP 94919368
Div ex patent EP 701716
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
EP 701716 B1 E G06F-012/02 Related to application EP 2002858
Related to patent EP 1197836
Based on patent WO 9429796
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE
DE 69431186 E G06F-012/02 Based on patent EP 701716
Based on patent WO 9429796
US 20040064474 A1 G06F-017/00 Cont of application US 9371640
Cont of application US 95464591
Cont of application US 99359168
Div ex application US 2000624753
Cont of patent US 6038570
Cont of patent US 6138126
US 6751637 B1 G06F-017/30 Cont of application US 95464591
Cont of application US 99359168
Cont of patent US 6038570
Cont of patent US 6138126
CA 2165911 C E G06F-017/30

**Method for allocating files in file system using disk arrays for storage - ...**

**...has mode selected with dirty block from list with write allocation of tree or buffers for reference for storage in raid array with determination of completion**

...Abstract (Basic): least one dirty block from a list of nodes having dirty blocks. The method then **write allocates** a tree (330) of buffers referenced by the node to a **storage** arrangement in a RAID array (1030). It is then determined if all nodes in a...

...All unwritten stripes are then **flushed** to the raid array (350). The algorithm then terminates. When **files** are stored in **cache** and selected for **allocation**, directions are **allocated** first. Then files are **allocated** on a least recently used basin...

...USE/ADVANTAGE - Multiple clients can **simultaneously** access different files stored on separate **disks** in the array. This reduces access time for retrieving or **storing** data...
...Title Terms: **ALLOCATE**;

35/3,K/6 (Item 6 from file: 350) **Links**
Derwent WPIX


015603745 **Image available**
WPI Acc No: 2003-665902/200363
XRPX Acc No: N03-531542

**A method of storing temporally consecutive values of at least one data item in a memory segment that can not be overwritten for small computing applications, uses sequential and bridging pointers**

Patent Assignee: SHARP KK (SHAF ); KAY A (KAYA-I); MILLER R (MILL-I)
Inventor: KAY A; MILLER R
Number of Countries: 103 Number of Patents: 006
Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|---|---|---|---|---|---|---|
| GB 2386212 | A | 20030910 | GB 20025573 | A | 20020309 | 200363 B |
| WO 200377133 | A1 | 20030918 | WO 2003JP2684 | A | 20030306 | 200371 |
| AU 2003211775 | A1 | 20030922 | AU 2003211775 | A | 20030306 | 200431 |
| US 20050119987 | A1 | 20050602 | WO 2003JP2684 | A | 20030306 | 200537 |
| | | | US 2005506070 | A | 20050222 | |
| JP 2003575281 | X | 20050707 | JP 2003575281 | A | 20030306 | 200545 |
| | | | WO 2003JP2684 | A | 20030306 | |
| TW 200400432 | A | 20040101 | TW 2003104924 | A | 20030307 | 200567 |

Priority Applications (No Type Date): GB 20025573 A 20020309
Patent Details:

| Patent No | Kind | Lan | Pg | Main IPC | Filing Notes |
|---|---|---|---|---|---|
| GB 2386212 | A | | 32 | G06F-012/02 | |
| WO 200377133 | A1 | J | | G06F-012/02 | |

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW

| | | | |
|---|---|---|---|
| AU 2003211775 | A1 | G06F-012/02 | Based on patent WO 200377133 |
| US 20050119987 | A1 | G06F-007/00 | |
| JP 2003575281 | X | 39 G06F-012/02 | Based on patent WO 200377133 |
| TW 200400432 | A | G06F-012/00 | |

**A method of storing temporally consecutive values of at least one data item in a memory segment that can not be overwritten for small computing applications, uses sequential and bridging pointers**

Abstract (Basic):

... A method of **storing** temporally consecutive values in a memory that can not be **overwritten** comprises **storing** data

as sets, each of which has two **pointers**, a local **pointer** and a far **pointer**, to enable chains to be established. The local, sequential, **pointer** is written to the data set immediately preceding the current set and the far, bridging, **pointer** to a data set earlier in the chain, both point to the current set.

... An INDEPENDENT CLAIM is included for an apparatus for **storing** temporally consecutively values of at least one data item...

...computing applications, such as embedded systems, including smart cards such as Java cards, digital active **storage** or security devices such as smart cards and smart **discs**, SIMS and USIMs for mobile telephones, data logging devices, small devices which record user preferences, store settings or log usage, computer systems in vehicles, set-top boxes and internet **routers**.

...

...The use of sequential and bridging **pointers** allows the chain to be shortened by jumping or bridging intermediate data sets facilitating the use of flash memory which has slow **erase** times and may rapidly wear out with repeated **erasure** required to the data in the same location each time it changes...

...The figure illustrates the initial part of a **Persistent** Data Item (PDI) structure after a large number of updates

...Title Terms: **STORAGE;**

International Patent Class (Main): **G06F-007/00**...

...**G06F-012/00**...

...**G06F-012/02**

Manual Codes (EPI/S-X): **T01-F05E**...

...**T01-H01C3**...

...**T01-H01D**

```
Set     Items   Description
S1     339800   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(DATA? OR RECORD? OR BLOCK? OR BYTE? OR BIT? ? OR PIECE?)
S2     168918   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(PACKET? OR CHUNK? OR FILE? OR CONTENT? OR INFORMATION?)
S3      25143   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(OBJECT? OR TRANSACTION? OR PORTION? OR PARCEL? OR SEGMENT?)
S4     686143   S DISK? OR DISC? ? OR DISKDRIV? OR DISCDRIV? OR HARDDISK? OR HDDISK? OR
HDDISC?
S5         15   S HARDDISC? OR DATABASEDISK? OR DATABASEDISC? OR HARDDRIVEDISK? OR
HARDDRIVEDISC?
S6      29954   S S1:S3 AND S4:S5
S7       9983   S TRANSFER? OR SEND? OR SHIP? OR DISPATCH? OR UPLOAD? OR DOWNLOAD? OR
SENT? OR TRANSMI?
S8      18962   S FORWARD? OR POST??? OR COPY? OR WRITE? OR WRITING? OR STORING? OR
STORAG? OR TRANSPORT?
S9       2481   S RELOCAT? OR MOVE? OR MOVING? OR MIGRAT? OR IMPORT? OR EXPORT? OR ROUTE?
OR ROUTING?
S10      4502   S LAST OR PREVIOUS? OR BEFORE? OR FINAL? OR CONCLUD? OR END OR ENDED OR
ENDING
S11      3176   S EARLY? OR EARLIER? OR PRIOR? OR PRELIMINAR? OR BEFOREHAND? OR PREDAT? OR
PREDETERMIN?
S12       694   S CLOSING? OR LATEST? OR LATTER? OR TERMINAT? OR ULTIMAT? OR CONCLUS? OR
REARMOST? OR REARWARD?
S13      1780   S BACK? OR CULMINAT?
S14      1379   S COMMIT? OR DEDICAT? OR RESERV? OR FINALIZ? OR FINALIS? OR SAVED OR
SAVING OR PERMANEN? OR NONTEMPORAR?
S15       758   S ALLOCAT? OR CONSIGN? OR PERPETUAL? OR ENDUR? OR PERSISTEN? OR
PERSISTING? OR NONTRANSIEN? OR "NOT" ()(TEMPORAR? OR TRANSIEN?)
S16      1046   S POINTER? OR ARROW? OR INDICATOR? OR MARKER? OR LOCATOR? OR IDENTIFIER?
OR LABEL?
S17      1319   S FLUSH? OR DELET? OR EXPUNG? OR RID OR RIDS OR RIDDING OR REMOV? OR
EXCIS?
S18      2910   S ERAS? OR OVERWRIT? OR (TAKE? OR TAKING? OR TAKEN)()OUT OR ELIMINAT? OR
UNINSTALL? OR DEINSTALL?
S19      2683   S SYNCHRON? OR CONCURR? OR COOCCUR? OR ISOCHRON? OR SIMULTAN?
S20       113   S CONTEMPORAN? OR SYNC???? OR IN()CONCERT? OR SYNCH???
S21      1297   S CONCURREN? OR COINCID? OR ( "SAME" OR IDENTIC? OR SIMILAR?)()TIME? ? OR
SYNK??
S22     13838   S IC=G06F?
S23      8414   S MC=T01?
S24      7354   S S6 AND S1:S3(10N)S7:S9(10N)S4:S5
S25       551   S S6 AND S1:S3(10N)S19:S21(10N)S4:S5
S26      7354   S S24 OR (S24 AND S25)
S27         0   S S26 AND S16(7N)S14:S15 AND S16(7N)S17:S18
S28         4   S S26 AND S16 AND S14:S15 AND S17:S18
S29         3   S S26 AND S14:S15(10N)S17:S18(10N)S10:S13
S30         7   S S28:S29
S31         7   S S30 AND S22:S23
S32        20   S S6 AND S7:S9 AND S16 AND S14:S15 AND S17:S18
S33        18   S S32 AND S22:S23
S34        23   S S28:S33
S35        23   IDPAT (sorted in duplicate/non-duplicate order)
S36        25   S S6 AND S7:S9 AND S14:S15 AND S17:S18 AND S19:S21
S37        23   S S36 NOT S34
S38        23   IDPAT (sorted in duplicate/non-duplicate order)
 ; show files
```

[File 347] **JAPIO** Dec 1976-2005/Dec(Updated 060404)

[File 350] **Derwent WPIX** 1963-2006/UD,UM &UP=200627

**File 350: For more current information, include File 331 in your search. Enter HELP NEWS 331 for details.*

35/3,K/11 (Item 11 from file: 350) **Links**
Derwent WPIX


014249822 **Image available**
WPI Acc No: 2002-070522/200210
XRPX Acc No: N02-052248
**Disk storage device shifts data in defect sector to reserve sector without interrupting continuous data record operation with respect to disk**
Patent Assignee: MATSUSHITA DENKI SANGYO KK (MATU )
Number of Countries: 001 Number of Patents: 001
Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week | |
|---|---|---|---|---|---|---|---|
| JP 2001312376 | A | 20011109 | JP 2000133094 | A | 20000502 | 200210 | B |

Priority Applications (No Type Date): JP 2000133094 A 20000502
Patent Details:

| Patent No | Kind | Lan | Pg | Main IPC | Filing Notes |
|---|---|---|---|---|---|
| JP 2001312376 | A | | 6 | G06F-003/06 | |

**Disk storage device shifts data in defect sector to reserve sector without interrupting continuous data record operation with respect to disk**

Abstract (Basic):
... A **reserve** sector position management unit (2) manages the position of **reserve** sector on a rotation medium. An address **pointer** controller (7) controls defect and **reserve** sector address **pointer**, such that the data in defect sector are shifted to the **reserve** sector, without interrupting continuous data **write**-in operation to a rotation medium from a **data buffer**.
... An INDEPENDENT CLAIM is also included for **disk** recording control method...

...**Disk storage** device...

...Time delay in head **transfer** operation and rotation, is **eliminated** as data in defect sector are shifted to a **reserve** sector during data recording, hence high speed **write**-in operation is achieved...

...The figure shows the component block diagram of **disk storage** device. (Drawing includes non-English language text...

...**Reserve** sector position management unit (2...
...Address **pointer** controller (7
Title Terms: **DISC;**

International Patent Class (Main): **G06F-003/06**
International Patent Class (Additional): **G06F-012/16...**
Manual Codes (EPI/S-X): **T01-C01...**

**...T01-H01C4**

```
Set     Items   Description
S1      76942   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(DATA? OR RECORD? OR BLOCK? OR BYTE? OR BIT? ? OR PIECE?)
S2      43472   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(PACKET? OR CHUNK? OR FILE? OR CONTENT? OR INFORMATION?)
S3      13768   S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR
INBUFFER?)(5N)(OBJECT? OR TRANSACTION? OR PORTION? OR PARCEL? OR SEGMENT?)
S4     523176   S DISK? OR DISC? ? OR DISKDRIV? OR DISCDRIV? OR HARDDISK? OR HDDISK? OR
HDDISC?
S5         15   S HARDDISC? OR DATABASEDISK? OR DATABASEDISC? OR HARDDRIVEDISK? OR
HARDDRIVEDISC?
S6       7274   S S1:S3 AND S4:S5
S7       1403   S TRANSFER? OR SEND? OR SHIP? OR DISPATCH? OR UPLOAD? OR DOWNLOAD? OR
SENT? OR TRANSMI?
S8       5048   S FORWARD? OR POST??? OR COPY? OR WRITE? OR WRITING? OR STORING? OR
STORAG? OR TRANSPORT?
S9        952   S RELOCAT? OR MOVE? OR MOVING? OR MIGRAT? OR IMPORT? OR EXPORT? OR ROUTE?
OR ROUTING?
S10      1258   S LAST OR PREVIOUS? OR BEFORE? OR FINAL? OR CONCLUD? OR END OR ENDED OR
ENDING
S11       365   S EARLY? OR EARLIER? OR PRIOR? OR PRELIMINAR? OR BEFOREHAND? OR PREDAT? OR
PREDETERMIN?
S12       275   S CLOSING? OR LATEST? OR LATTER? OR TERMINAT? OR ULTIMAT? OR CONCLUS? OR
REARMOST? OR REARWARD?
S13       765   S BACK? OR CULMINAT? OR "NEAR" OR CLOSEST? OR PROXIMA?
S14       690   S COMMIT? OR DEDICAT? OR RESERV? OR FINALIZ? OR FINALIS? OR SAVED OR
SAVING OR PERMANEN? OR NONTEMPORAR? OR FIXED
S15       742   S ALLOCAT? OR CONSIGN? OR PERPETUAL? OR ENDUR? OR PERSISTEN? OR
PERSISTING? OR NONTRANSIEN? OR "NOT" ()(TEMPORAR? OR TRANSIEN?)
S16       126   S POINTER? OR ARROW? OR INDICATOR? OR MARKER? OR LOCATOR? OR IDENTIFIER?
OR LABEL?
S17       250   S FLUSH? OR DELET? OR EXPUNG? OR RID OR RIDS OR RIDDING OR REMOV? OR
EXCIS?
S18       463   S ERAS? OR OVERWRIT? OR (TAKE? OR TAKING? OR TAKEN)()OUT OR ELIMINAT? OR
UNINSTALL? OR DEINSTALL?
S19       719   S SYNCHRON? OR CONCURR? OR COOCCUR? OR ISOCHRON? OR SIMULTAN? OR RECONCIL?
S20        23   S CONTEMPORAN? OR SYNC???? OR IN()CONCERT? OR SYNCH??? OR CONTINUIT?
S21       441   S CONCURREN? OR COINCID? OR ( "SAME" OR IDENTIC? OR SIMILAR?)()TIME? ? OR
SYNK??
S22       118   S S6 AND S1:S3 AND S4:S5 AND S7:S9 AND S14:S15 AND S17:S18
S23        59   S S22 AND (S10:S13 OR S19:S21)
S24         6   S S22 AND S16
S25       118   S S22:S24
S26        98   S S25 AND PY=1970:2003
S27        98   S S25 NOT PY=2004:2006
S28        98   S S26:S27
S29        71   RD  (unique items)
 ; show files
```

[File 2] **INSPEC** 1898-2006/Apr W3


[File 6] **NTIS** 1964-2006/Apr W2


[File 8] **Ei Compendex(R)** 1970-2006/Apr W3


[File 34] **SciSearch(R) Cited Ref Sci** 1990-2006/Apr W3

29/3,K/5 (Item 5 from file: 2) **Links**
INSPEC

07225485 **INSPEC Abstract Number:** C1999-05-6160-014
**Title: Integrating reliable memory in databases**
**Author** Wee Teck Ng; Chen, P.M.
**Author Affiliation:** Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA
**Conference Title:** Proceedings of the Twenty-Third International Conference on Very Large Databases p. 76-85
**Editor(s):** Jarke, M.; Carey, M.; Dittrich, K.R.; Lockovsky, F.; Loucopoulos, P.; Jeusfeld, M.A.
**Publisher:** Morgan Kaufmann Publishers , San Francisco, CA, USA
**Publication Date:** 1997 **Country of Publication:** USA xvi+599 pp..
**ISBN:** 1 55860 470 7 **Material Identity Number:** XX-1997-02713
**Conference Title:** Proceedings of VLDB 97: 23rd International Conference on Very Large Databases
**Conference Date:** 26-29 Aug. 1997 **Conference Location:** Athens, Greece
**Language:** English
**Subfile:** C

**Title: Integrating reliable memory in databases**
**Abstract: ...it is possible to create an area of main memory that is as safe as disk from operating system crashes. This paper explores how to integrate the reliable memory provided by the Rio file cache into a database system. We propose three designs for integrating reliable memory into databases: non-persistent database buffer cache, persistent database buffer cache, and persistent database buffer cache with protection. Non- persistent buffer caches use an I/O interface to reliable memory and require the fewest modifications to existing databases. However, they waste memory capacity and bandwidth due to double buffering. Persistent buffer caches use a memory interface to reliable memory by mapping it into the database address space. This places reliable memory under complete database control and eliminates double buffering, but it may expose the buffer cache to database errors. Our third design reduces this exposure by write protecting the buffer pages. Extensive fault tests show that mapping reliable memory into the database address space does not significantly hurt reliability. This is because wild stores rarely touch dirty, committed pages written by previous transactions. As a result, we believe that databases should use a memory interface to reliable memory.**
**Descriptors: cache storage;**
**Identifiers: ...Rio file cache; ... ...database buffer cache; ... ...persistent database buffer cache; ... ...persistent database buffer cache with protection**
**1997**

29/3,K/9 (Item 9 from file: 2) **Links**

Fulltext available through: USPTO Full Text Retrieval Options



06429837 **INSPEC Abstract Number:** B9701-1265D-011, C9701-6120-007

**Title: The Rio file cache: surviving operating system crashes**

**Author** Chen, P.M.; Wee Teck Ng; Chandra, S.; Aycock, C.; Rajamani, G.; Lowell, D.
**Author Affiliation:** Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA

**Journal:** SIGPLAN Notices **Conference Title:** SIGPLAN Not. (USA) vol.31, no.9 p. 74-83
**Publisher:** ACM ,
**Publication Date:** Sept. 1996 **Country of Publication:** USA
**CODEN:** SINODQ **ISSN:** 0362-1340
**SICI:** 0362-1340(199609)31:9L.74:FCSO;1-L
**Material Identity Number:** S202-96009
**U.S. Copyright Clearance Center Code:** 0 89791 767 7/96/$0010.$3.50
**Conference Title:** 7th International Conference on Architectural Support for Programming Languages and Operating Systems
**Conference Sponsor:** ACM
**Conference Date:** 1-5 Oct. 1996 **Conference Location:** Cambridge, MA, USA
**Language:** English
**Subfile:** B C



**Title: The Rio file cache: surviving operating system crashes**

**Abstract: One of the fundamental limits to high performance, high reliability file systems is memory's vulnerability to system crashes. Because memory is viewed as unsafe, systems periodically write data back to disk. The extra disk traffic lowers performance, and the delay period before data is safe lowers reliability. The goal of the Rio (RAM I/O) file cache is to make ordinary main memory safe for persistent storage by enabling memory to survive operating system crashes. Reliable memory enables a system to achieve the best of both worlds: reliability equivalent to a write through file cache, where every write is instantly safe, and performance equivalent to a pure write back cache, with no reliability induced writes to disk. To achieve reliability, we protect memory during a crash and restore it during a reboot... ...even without protection, warm reboot enables memory to achieve reliability close to that of a write through file system. Adding protection makes memory even safer than a write through file system while adding essentially no overhead. By eliminating reliability induced disk writes, Rio performs 4-22 times as fast as a write through file system, 2-14 times as fast as a standard Unix file system, and...**

**Descriptors: cache storage; ... ...random-access storage; ... ...storage management**
**Identifiers: Rio file cache; ... ...disk traffic... ...RAM I/O file cache; ... ...persistent storage; ... ...write through file cache; ... ...pure write back cache... ...write through file system... ...reliability induced disk writes**
**1996**

29/3,K/11 (Item 11 from file: 2) **Links**
INSPEC

05966804 **INSPEC Abstract Number:** C9507-6150J-014
**Title: Opportunistic log: efficient installation reads in a reliable storage server**
**Author** O'Toole, J.; Shrira, L.
**Author Affiliation:** Lab. for Comput. Sci., MIT, Cambridge, MA, USA
p. 39-48
**Publisher:** USENIX Assoc , Berkeley, CA, USA
**Publication Date:** 1994 **Country of Publication:** USA 280 pp.
**Conference Title:** Proceedings of 1st Symposium on Operation Systems Design and Implementation
**Conference Sponsor:** ACM; IEEE
**Conference Date:** 14-17 Nov. 1994 **Conference Location:** Monterey, CA, USA
**Language:** English
**Subfile:** C

**Title: Opportunistic log: efficient installation reads in a reliable storage server**
**Abstract: In a distributed storage system, client caches managed on the basis of small granularity objects can provide better memory utilization than page-based caches. However, object servers, unlike page servers, must perform additional disk reads. These installation reads are required to install modified objects onto their corresponding disk pages. The opportunistic log is a new technique that significantly reduces the cost of installation reads. It defers the installation reads, removing them from the modification commit path, and manages a large pool of pending installation reads that can be scheduled efficiently... ...simulations, we show that the opportunistic log substantially enhances the I/O performance of reliable storage servers. An object server without the opportunistic log requires much better client caching to outperform... ...imply that efficient scheduling of installation reads can substantially improve the performance of large-scale storage systems and therefore introduces a new performance tradeoff between page-based and object-based architectures.**
**Descriptors: cache storage;**
**Identifiers: ...reliable storage server... ...distributed storage system... ...disk reads... ...disk pages... ...modification commit path... ...large-scale storage systems**
**1994**

29/3,K/35 (Item 6 from file: 8) **Links**
Ei Compendex(R)

05005623 **E.I. No:** EIP98054178943
**Title: Disk cache design and performance as evaluated in large timesharing and database systems**

**Author:** Zivkov, Barbara Tockey; Smith, Alan Jay
**Corporate Source:** Univ of California, Berkeley, Berkeley, CA, USA
**Conference Title:** Proceedings of the 1997 23rd International Conference for the Resource Management & Performance Evaluation of Enterprise Computing Systems. Part 1 (of 2)
**Conference Location:** Orlando, FL, USA **Conference Date:** 19971207-19971212
**E.I. Conference No.:** 48275
**Source:** CMG Proceedings v 1 1997. CMG, Turnersville, NJ, USA. p 639-658
**Publication Year:** 1997
**CODEN:** CMPREY
**Language:** English
**Title: Disk cache design and performance as evaluated in large timesharing and database systems**
**Abstract: We present trace-driven simulations of disk caches using traces from production timesharing and database systems. We compute miss and traffic ratios, run lengths, residency times, memory pollution, etc., with varying block size, prefetch and write algorithms. Prefetch produced limited decreases in miss ratio. Copy-back decreased disk writes. Periodic flushing of dirty blocks increased traffic slightly. Write-allocate had little effect. Large blocks weren't useful. Limiting cache occupancy by a single transaction had little effect. The study is unique in the variety and quality of the data...**
**Descriptors: *Buffer storage; Database systems; Time sharing systems; Algorithms; Computational methods; Data processing; Computer simulation; Storage allocation (computer)**
**Identifiers: Trace driven simulations; Dirty blocks flushing**

29/3,K/37 (Item 8 from file: 8) **Links**
Ei Compendex(R)

04629421 **E.I. No:** EIP97023531879
**Title: Disk caching in large database and timeshared systems**

**Author:** Zivkov, Barbara Tockey; Smith, Alan Jay
**Corporate Source:** Univ of California, Berkeley, CA, USA
**Conference Title:** Proceedings of the 1997 5th International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, MASCOTS'97
**Conference Location:** Haifa, Isr **Conference Date:** 19970112-19970115
**E.I. Conference No.:** 46048
**Source:** IEEE International Workshop on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems - Proceedings 1997. IEEE, Piscataway, NJ, USA,97TB100096. p 184-195
**Publication Year:** 1997
**CODEN:** 85ORAG
**Language:** English
**Title: Disk caching in large database and timeshared systems**
**Abstract: We present the results of a variety of trace-driven simulations of disk cache design using traces from a variety of mainframe timesharing and database systems in production... ...pollution and other statistics for a variety of designs, varying block size, prefetching algorithm and write algorithm. We find that for this workload, sequential prefetching produces a significant (about 20%) but still limited improvement in the miss ratio, even using a powerful technique for detecting sequentiality. Copyback writing decreased write traffic relative to write-through by more than 50%; periodic flushing of the dirty blocks increased write traffic only slightly compared to pure write- back, and then only for large cache sizes. Write- allocate had little effect compared to no-write- allocate. Block sizes of over a track don't appear to be useful. Limiting cache occupancy...**
**Descriptors: *Distributed database systems; Buffer storage; Storage allocation (computer); Sequential switching; Algorithms; Statistical methods**
**Identifiers: Mainframe timesharing; Miss ratios; Run length; Traffic ratios; Cache residency times; Memory pollution; Prefetching algorithm; Write algorithm; Disk caching**

29/3,K/51 (Item 1 from file: 34) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

07055482 **Genuine Article#:** 119FQ **No. References:** 48
**Integrating reliable memory in databases**

**Author:** Ng WT (REPRINT) ; Chen PM
**Corporate Source:** UNIV MICHIGAN,DEPT ELECT ENGN & COMP SCI, COMP SCI & ENGN DIV, 1301 BEAL AVE/ANN ARBOR//MI/48109 (REPRINT)
**Journal:** VLDB JOURNAL , **1998** , V 7 , N3 ( AUG ) , P 194-204
**ISSN:** 1066-8888 **Publication date:** 19980800
**Publisher:** SPRINGER VERLAG , 175 FIFTH AVE, NEW YORK, NY 10010
**Language:** English **Document Type:** ARTICLE ( ABSTRACT AVAILABLE )
**Integrating reliable memory in databases**
**, 1998**
**Abstract: ...it is possible to create an area of main memory that is as safe as disk from operating system crashes. This paper explores how to integrate the reliable memory provided by the Rio file cache into a database system, Prior studies have analyzed the performance benefits of reliable memory, we focus instead on how different designs affect reliability. We propose three designs for integrating reliable memory into databases: non-persistent database buffer cache,persistent database buffer cache, and persistent database buffer cache with protection. Non- persistent buffer caches use an I/O interface to reliable memory and require the fewest modifications to existing databases. However, they waste memory capacity and bandwidth due to double buffering. Persistent buffer caches use a memory interface to reliable memory by mapping it into the database address space. This places reliable memory under complete database control and eliminates double buffering, but it may expose the buffer cache to database errors. Our third design reduces this exposure by write protecting the buffer pages. Extensive fault tests show that mapping reliable memory into the database address space does not significantly hurt reliability. This is because wild stores rarely touch dirty, committed pages written by previous transactions. As a result, we believe that databases should use a memory interface to reliable memory.**
**Identifiers-- ...HIGH-PERFORMANCE; FAULT INJECTION; SYSTEM; RECOVERY; STORAGE; FINE**

29/3,K/67 (Item 2 from file: 94) **Links**

Fulltext available through: USPTO Full Text Retrieval Options

JICST-EPlus



02198385 **JICST Accession Number:** 94A0732377 **File Segment:** JICST-E

**A Data Management Method for Flash Memory and Its Performance Evaluation.**

TAKAKURA HIROKI (1); KANBAYASHI YAHIKO (1)

(1) Kyoto Univ., Fac. of Eng.

Joho Shori Gakkai Kenkyu Hokoku , **1994** , VOL.94,NO.62(DBS-99) , PAGE.233-240 , FIG.17, REF.6

**Journal Number:** Z0031BAO **ISSN:** 0919-6072

**Universal Decimal Classification:** 681.3:061.68 681.32+

**Language:** Japanese **Country of Publication:** Japan

**Document Type:** Journal

**Article Type:** Original paper

**Media Type:** Printed Publication

**A Data Management Method for Flash Memory and Its Performance Evaluation. , 1994**

**Abstract: In order to realize highly reliable main momory databases, main memory data should periodically be checkpointed to archive storages. Since flash memory can realize faster access speed than disks, utilization of flash memory as archive storages can realize effective checkpoint operations. Furthermore, a requirement to used flash memory as archive and secondary storages is arisen. In this paper a data management method to realize such storages is discussed. A method which utilizes special data structure, F-tree, and overwrite technique without erase operations is also discussed. Simulation results show that our method can practically utilize flash memory for secondary storages. (author abst.)**

**Descriptors: ...storage management**

**Broader Descriptors: ...resistance(endure);**

# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 20 | "20050119987" "20040064474" "20020073082" "20030163663" "20050216653" "20020032691" ("5345581" "4905184" "4864532" "6067551").pn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:35 |
| L2 | 0 | L1 and (((transfer$4 transmit$6) near5 block$1) and ((last near3 pointer) SAME (pend$3 NEAR3 transfer$4) SAME synchronizat$4)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:36 |
| L3 | 0 | L1 and (determin$5 WITH (committ$5) With (transferr$3 transmitt$4)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:37 |
| L4 | 0 | L1 and (determin$5 WITH (committ$5) With (transferr$3)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:38 |
| L5 | 0 | L1 and (transfer$5 and (point$3) and (block$1 WITH record$1)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:39 |
| L6 | 0 | L1 and ((transfer$5 transmit$6 send$) and (point$3) and (block$1 WITH record$1)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:39 |
| L7 | 1 | L1 and ((memory disk) near3 database) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:41 |
| L8 | 1 | L1 and (((memory disk) near3 database) and (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:41 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S1 | 1 | "611552".apn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:41 |
| S2 | 16 | "20020174138" "20020029214" ("6457021" "6341288" "6321234" "6205449" "6298425" "6032158"). pn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 13:44 |
| S5 | 3574 | RDBMS OR (relational adj data$base adj managment adj system) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:37 |
| S7 | 257 | S5 and (((synchronize$1 OR synchronization) OR link$3) near3 record$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:44 |
| S13 | 8 | ("20020174138" "20020029214" ("6457021" "6341288" "6321234" "6205449" "6298425" "6032158"). pn.) and (synchronize$1 or synchronization or link$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:47 |
| S14 | 0 | S13 and (meta$data or metadata) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:47 |
| S15 | 7 | S13 and structure$1 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 09:47 |
| S16 | 5 | S15 and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:50 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S17 | 189 | Tamino | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:50 |
| S21 | 173 | $software$ag$.AS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:52 |
| S23 | 73 | $software$ag.AS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:53 |
| S24 | 23 | software$ag.AS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:53 |
| S26 | 5 | software$ag.AS. and (synchroniz$3 or link$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:54 |
| S27 | 3 | software$ag.AS. and (synchroniz$3 or link$3) and (header OR meta$data OR metadata) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:56 |
| S28 | 2 | software$ag.AS. and (synchroniz$3 or link$3) and (header OR meta$data OR metadata) and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 10:55 |
| S29 | 88 | S7 and (meta$data or metadata or header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:02 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S30 | 41 | S29 and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:02 |
| S31 | 36 | S30 and (data near1 structure) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:03 |
| S32 | 36 | S31 and ((link$3 OR synchroniz$4) near3 (record or data)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:04 |
| S33 | 28 | S31 and (transfer$4) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:40 |
| S34 | 0 | S33 and (software$ag.AS.) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:08 |
| S35 | 4554 | 707/1.ccls. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:40 |
| S36 | 53 | S35 and (synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer) and ((relational adj data$base adj management adj system) or RDMS) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:04 |
| S37 | 0 | S36 and (name AND (last adj1 pointer) and (flush adj1 pointer) and ((head or lead) adj pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:42 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S38 | 42 | S36 and (data adj1 structure) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:32 |
| S39 | 4009 | "42" and ((creat$3 OR making OR opening) near2 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:44 |
| S40 | 1 | S38 and ((creat$3 OR making OR opening) near2 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 11:44 |
| S41 | 0 | "5329619".pn. and (synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer) and ((relational adj data$base adj management adj system) or RDMS) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:31 |
| S42 | 1 | "5329619".pn. and ((synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:14 |
| S43 | 0 | "5329619".pn. and ((synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer)) and (new near2 (data or record)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:14 |
| S44 | 1 | "5329619".pn. and ((synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer)) and (data or record) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:20 |
| S45 | 298373 | (data or document) near3 (retrieval OR retriev$3 OR access$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:20 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S46 | 39297 | S45 and (writing) near3 (data OR record) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:21 |
| S47 | 33 | S46 and hearder | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:21 |
| S48 | 33 | S47 and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:21 |
| S49 | 32 | S48 and (transfer$4 or moving or copy$3) near3 (data OR record$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:23 |
| S50 | 0 | S49 and ((synchroniz$4 OR link$3) WITH new WITH header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:23 |
| S51 | 0 | S48 and (data NEAR2 strucutre) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:24 |
| S52 | 0 | S49 and (data NEAR2 strucutre) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:24 |
| S53 | 32 | S49 and (data NEAR2 structure) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:24 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S54 | 1 | S53 and 707/1.ccls. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:24 |
| S55 | 9 | S53 and "707"/$.ccls. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:39 |
| S56 | 299 | RDBMS and daemon | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:39 |
| S57 | 39 | S56 and (new near3 record) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:40 |
| S58 | 0 | S57 and ((writting OR write$1) WITH (new adj2 record)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:41 |
| S59 | 23 | S57 and (writting OR write$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 12:42 |
| S60 | 4 | S59 and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:16 |
| S61 | 5412 | (updat$3 or writ$3 or synchroniz$3 or synchronization) near (real$time or realtime or partial or "as available" or undemand$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:34 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S62 | 168 | S61 and "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:18 |
| S63 | 75 | S62 and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:18 |
| S64 | 69 | S63 and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:18 |
| S65 | 66 | S64 and (transferring OR transfer$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:34 |
| S66 | 0 | S65 and (last near commit near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:33 |
| S67 | 0 | S65 and (commit near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:20 |
| S68 | 0 | S65 and (committing near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:20 |
| S69 | 10 | S65 and (head near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/13 13:20 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S76 | 8132 | (updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:58 |
| S77 | 11396 | "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:58 |
| S78 | 276 | S76 and S77 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:58 |
| S80 | 115 | S78 and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:58 |
| S81 | 107 | S80 and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:58 |
| S82 | 10 | S81 and ((link$3 OR synchroniz$3) near2 record$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:59 |
| S83 | 8 | S81 and ((creat$3 OR mak$3) near2 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 10:59 |
| S84 | 5 | S82 and S83 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 11:06 |
| S86 | 1 | ("2003/0229884").URPN. | USPAT | OR | ON | 2005/12/14 13:35 |

# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| S90 | 1 | ("20030229884" or "6954757.pn.") and (updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 13:33 |
| S91 | 2 | "6954757".pn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 13:33 |
| S92 | 1 | ("2003/0229884").URPN. | USPAT | OR | ON | 2005/12/14 13:36 |
| S93 | 2 | ("20020174138" "20020029214" ("6457021" "6341288" "6321234" "6205449" "6298425" "6032158"). pn.) and "linked list" and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 13:45 |
| S94 | 2 | ("6457021" "6341288").pn. and header and "linked list" and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 13:46 |
| S95 | 2 | S94 and ((updat$3 or writing or write$1 or synchronization or synchroniz$3) near3 (record$1 or data or realtime or partial or available or undemand)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:07 |
| S96 | 2 | "6151602".pn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:04 |
| S97 | 2 | "6151602".pn. and ((updat$3 or writing or write$1 or synchronization or synchroniz$3) near3 (record$1 or data or realtime or partial or available or undemand)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:05 |
| S99 | 1 | "6151602".pn. and ((updat$3 or writing or write$1 or synchronization or synchroniz$3) near3 (record$1 or data or realtime or partial or available or undemand)) and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:05 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S100 | 1 | "6151602".pn. and ((updat$3 or writing or write$1 or synchronization or synchroniz$3) near3 (record$1 or data or realtime or partial or available or undemand)) and header and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:05 |
| S101 | 2 | ("6341288" or "6151602").pn. and header and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:08 |
| S105 | 2 | ("6341288" or "6151602").pn. and ((generat$3 or build$3 or creat$3 or making or make$1 or new) near3 header) and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:19 |
| S108 | 1 | ("6341288" or "6151602").pn. and ((generat$3 or build$3 or creat$3 or making or make$1 or new) near3 header) and pointer and "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:20 |
| S109 | 1 | ("6341288" or "6151602").pn. and ((generat$3 or build$3 or creat$3 or making or make$1 or new) near3 header) and pointer and ((updat$3 or writ$3 or synchroniz$3 or link$3) near (real$time or partial or "as avilable" or undemand or new)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 17:24 |
| S110 | 1 | (("6341288" or "6151602").pn. and ((generat$3 or build$3 or creat$3 or making or make$1 or new) near3 header) and pointer and ((updat$3 or writ$3 or synchroniz$3 or link$3) near (real$time or partial or "as avilable" or undemand or new))) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 19:20 |
| S112 | 1 | "6457021".pn. and (link$3 or synchronization or synchroniz$3 or combining or combine$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 18:16 |
| S114 | 1 | "6341288".pn. and (link$3 or synchronization or synchroniz$3 or combining or combine$1) and header and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 18:48 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S116 | 1 | "611552".apn. and "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 18:48 |
| S118 | 2 | ("6457021" "6341288").pn. and header and "linked list" and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/14 19:22 |
| S119 | 2 | "6754648".pn. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 07:15 |
| S121 | 0 | "6754648".pn. and ((updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 07:46 |
| S122 | 1 | "6856993".pn. and ((updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 07:46 |
| S123 | 1 | "6856993".pn. and ((updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3) and header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 07:47 |
| S124 | 1 | "6856993".pn. and ((updat$3 or writ$3 or synchroniz$3 or synchronization) near2 (real$time or realtime or partial or "as available" or undemand$3) and header and pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 08:12 |
| S125 | 2 | ("6341288" "6457021").pn. and (transfer$4 OR mov$3 OR relocat$3) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 09:08 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S126 | 47 | list SAME (commit OR committing OR committed) same header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 09:58 |
| S127 | 16 | S126 and "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 09:10 |
| S128 | 29 | S126 and pointer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 09:10 |
| S129 | 16 | S127 and S128 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 11:56 |
| S130 | 0 | "5701480".pn. and (list SAME (commit OR committing OR committed) same header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:05 |
| S131 | 3 | S129 and tail | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 11:05 |
| S132 | 3 | S131 and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 11:05 |
| S133 | 0 | ("5870751" "6785696").pn. and ((creat$3 or mak$3 or new or generat$3) WITH header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 11:56 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S134 | 2 | ("5870751" "6785696").pn. and header | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 11:43 |
| S135 | 11 | S129 and ((creat$3 or mak$3 or new or generat$3) WITH header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:09 |
| S139 | 23361 | ((creat$3 or mak$3 or new or generat$3) near5 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:40 |
| S140 | 13467 | ((creat$3 or mak$3 or new or generat$3) near2 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:10 |
| S141 | 7724 | ((creat$3 or mak$3 or new or generat$3) near1 header) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:10 |
| S142 | 451 | S141 and "linked list" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:58 |
| S144 | 0 | S142 and (commit Near5 history) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:11 |
| S145 | 2 | S142 and (commit WITH pointer$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:11 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S148 | 402 | S142 and pointer$1 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:59 |
| S150 | 205 | S148 and (new near (record or data)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 12:59 |
| S151 | 154 | S150 and ((transfer$1) near1 (record or data)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 13:07 |
| S152 | 10 | S150 and ((transfer$1) near1 (record or data) near4 list) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 13:01 |
| S153 | 8 | S151 and "707"/$.ccls. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 13:21 |
| S154 | 4 | S153 and commit$4 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 13:21 |
| S155 | 13 | ("4586027" \| "4775969" \| "4849878" \| "4853921" \| "4868570" \| "4891784" \| "5194995" \| "5200864" \| "5280600" \| "5298895" \| "5313604" \| "5335328" \| "5481701").PN. | US-PGPUB; USPAT; USOCR | OR | ON | 2005/12/15 14:35 |
| S156 | 1 | "5870751".pn. and pointer$1 and "linked list" and header and commit$4 and (creat$3 or generat$3) and link$3 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/15 16:11 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S163 | 4 | ("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (disk$memory OR disk OR virtual) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 11:00 |
| S167 | 5 | ("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (flag$1 or bit or pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:46 |
| S169 | 9881 | ((accomplish$3 commit or committed or committing) near3 (flag$1 or bit or pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:46 |
| S170 | 491 | ((commit or committed or committing) near3 (flag$1 or bit or pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:46 |
| S171 | 137 | ((commit or committed or committing) near3 (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:46 |
| S172 | 59 | ((commit or committed or committing) near (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:50 |
| S173 | 48 | ((flush$3) near (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:47 |
| S174 | 3 | ((last or end$3) near flush$3 near (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:47 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S175 | 1 | ((last or end$3) near (commit or committed or committing) near (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:48 |
| S176 | 6 | ((last or end$3) near2 (commit or committed or committing) near2 (pointer)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 10:48 |
| S177 | 18 | ((commit or committed or committing) near (pointer)) WITH (data or record) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:09 |
| S178 | 4 | ("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (disk$memory OR disk OR virtual) and transfer$4 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 11:01 |
| S179 | 0 | "6128771".pn. and "not committed" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 11:54 |
| S180 | 1 | "6128771".pn. and (committed OR commit$4) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 12:06 |
| S181 | 1 | "6128771".pn. and "commit transaction" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 12:06 |
| S182 | 4 | (((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush$3 OR (ready near3 commit$4)) near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 12:20 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S183 | 3 | (((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush$3 OR (ready near3 commit$4)) near pointer) and "read pointer" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/12/18 12:22 |
| S184 | 3 | (((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush$3 OR (ready near3 commit$4)) near pointer) and "read pointer" and "write pointer" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:09 |
| S185 | 19 | ((commit or committed or committing) near (pointer)) WITH (data or record) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:43 |
| S186 | 3 | (((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush$3 OR (ready near3 commit$4)) near pointer) and "read pointer" and "write pointer" | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:09 |
| S187 | 8845 | 707/101,100,102.ccls. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:29 |
| S188 | 1 | S187 and S185 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:29 |
| S189 | 131 | S187 and (synchroniz$4 OR link$3) and (meta$data or metadata OR header) and (pointer) and ((relational adj data$base adj management adj system) or RDMS) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:31 |
| S190 | 88 | S189 and (data adj1 structure) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:32 |

# EAST Search History

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|---|---|---|---|---|---|---|
| S191 | 1 | S190 and (last near commit near pointer) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:33 |
| S192 | 59 | S190 and (transferring OR transfer$1) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:34 |
| S193 | 2 | S192 and ((updat$3 or writ$3 or synchroniz$3 or synchronization) near (real$time or realtime or partial or "as available" or undemand$3)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/24 15:34 |
| S194 | 0 | (S185 or S187) and (((transfer$4 transmit$6) near5 block$1) and ((last near3 pointer) SAME (pend$3 NEAR3 transfer$4) SAME synchronizat$4)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:36 |
| S195 | 5 | (S185 or S187) and (determin$5 WITH (committ$5) With (transferr$3 transmitt$4)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:37 |
| S196 | 4 | (S185 or S187) and (determin$5 WITH (committ$5) With (transferr$3)) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2006/04/28 11:38 |